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Craig Standing
Edith Cowan University

Patricia Mcmanus
Edith Cowan University

Susan Standing
Edith Cowan University

Heikki Karjaluoto

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Craig Standing* (c.standing@ecu.edu.au)
Patricia McManus* (p.mcmanus@ecu.edu.au)
Susan Standing* (s.standing@ecu.edu.au)
Heikki Karjaluoto** (heikki.karjaluoto@oulu.fi)

*School of Management Information Systems, Edith Cowan University, Western Australia
** Department of Marketing, University of Oulu, Finland

Abstract

The use of mobile services has increased rapidly in recent. Although research has been conducted on which services people use and the benefits they attach to those services, the values associated with the adoption and use of m-services at the individual level is still unclear. This formation systems field various technology adoption models have been proposed and validated in relation to technology adoption within an organisational setting but personal adoption and use of technology is less researched. To help uncover the values behind adoption of m-services we use means-end chains and laddering techniques. The analysis of the interviews shows that mobile services often fulfil such basic needs as self-esteem, achievement, individuality, belonging and well-being. Exploring the realization of values as a theoretical framework offers researchers a way forward in environments characterised by individual technology decisions.

Keywords

Mobile services, adoption, laddering, values

INTRODUCTION

Industry analysts have high expectations of consumers' willingness to adopt mobile services. However, there is still uncertainty in relation to understanding why an individual adopts electronic channels, and the intrinsic influential factors, such as consumers' attitudes and values in relation to electronic channels (Venkatesh & Brown, 2001; Anckar, 2002). Anckar (2002, p3) pointed out that "the main reason for value-adding elements in m-commerce, the consumers' actual reasons – the primary drivers for adopting m-commerce remain unclear". The importance of understanding what motivates adoption becomes even more critical for m-services as adoption rates are expected to rapidly increase (Anckar, 2002). Some of the reasons behind this optimistic forecast are the low cost associated with m-commerce hardware (e.g. mobile telephones) and consumers' familiarity with mobile telephones (Ropers, 2001; Anckar, 2002).

Mobile services embrace terms such as mobile communication, mobile collaboration and mobile commerce (Sarker & Wells, 2003). Whilst there is some overlap between these terms it can be argued that mobile communication includes voice, Short Messaging Service (SMS) and Multimedia Messaging Service (MMS) whilst the same services can be used to collaborate on projects and can additionally draw upon information and news from Web sites. Mobile commerce involves information, news, and the purchase of physical goods and services. In this paper the term m-services is used to describe the ability to send and receive communication and purchase goods/services through a wireless public (e.g. Internet) or private network enabled device like a mobile telephone or a personal digital assistant (Balasubramanian, Peterson & Jarvenpaa., 2002; Clark, 2001, Han, Harkke, Landor, & Mio, 2002; Junglas, 2002).

Various theories are used in information systems to determine the patterns of adoption of technologies at an organisational level. However, the reasons for adoption of technologies and services at the individual level are less understood. The aim of this paper is to determine the reasons for m-services adoption and usage at the individual level. Means-end chains and laddering are explained and examples are used to show the reasons underpinning different consumer value choice perceptions. Finally, the significance of value based theories as an explanatory theory at the individual level is assessed.

THEORETICAL PERSPECTIVES ON M-SERVICES ADOPTION AND USE

This section of the paper examines the factors that drive consumers' adoption and willingness to adopt and use m-services. There has been a number of m-commerce consumer adoption studies conducted. Barnes and Huff (2003) use Rogers' (1995) innovation and diffusion theory to examine the diffusion of Internet access via mobile telephones (iMode). Rogers developed a number of characteristics that explain innovation diffusion: 1) Relative

advantage: the degree to which the technology provides an advantage over other methods, 2) Compatibility: the degree to which the technology is compatible with how people work or behave, 3) Complexity: whether people perceive the technology as easy to understand and use, 4) Trialability: the degree to which a technology can be trialled before being adopted, 5) Observability: the level of visibility of the product to the other members of the adopter's social group.

Barnes and Huff (2003) conclude that iMode's success in Japan is unlikely to be replicated to the same extent in other countries since the conditions that prevailed in Japan do not exist elsewhere to the same extent. The low level of PC adoption, high market saturation of mobile telephones and fierce competition between trusted brands who are putting together cost-effective mobile Internet packages enable consumers in Japan to readily access mobile services.

Studies related to advertising and marketing are closely associated with consumer attitudes and built around the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and its applications to IT settings. The theory provides a framework to understand why people behave as they do when making decisions. TRA proposes that the use of technology can be predicted by a person's behavioural intention and that this is determined by a person's attitude towards using the technology. A person's attitude is shaped by their positive or negative feelings towards performing a specific behaviour (or using a technology) and whether people who are personally important, typically in the workplace, think that they should or should not perform the behaviour.

Using a form of TRA Tsang, Ho and Liang (2004) examine the link between attitude, intention and behaviour in relation to m-marketing. In their model entertainment, information content, irritation and credibility are seen to shape attitudes with permission having a major impact. The availability of incentives, such as free calls, impacts on the intention to receive m-marketing for certain attitudes. Intention is directly related to behaviour in relation to m-marketing. Their study findings indicate that consumers have a negative attitude towards mobile advertising unless they have consented to it. All four attributes of mobile advertising impact significantly on attitude towards mobile advertising. Attitude was significantly correlated to intention with incentives also positively impacting on intention. There was a strong correlation between intention and behaviour. This study was conducted in Taiwan with a large percentage of respondents regularly using SMS, although it is unclear from the results presented the extent to which respondents had received mobile advertising.

The Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Davis & Venkatesh, 1996; Mathieson, 1991) is tailored to information systems contexts and is designed to predict IT acceptance and usage in the workplace. It focuses on perceived usefulness of the technology and perceived ease of use. In m-commerce adoption research conducted by Wu and Wang (2004) perceived ease of use was not found to be significant. TAM has been extended to include a third belief called perceived enjoyment (Davis, Bagozzi & Warshaw, 1992) where using the computer is perceived to be enjoyable in its own right (hedonic) and quite separate from performance issues (Van der Heijden, 2004). The consumer behaviour literature shows that utilitarian, in the sense of instrumental value, or hedonic benefits determine the intention to consume. In some m-commerce studies hedonistic factors including entertainment value have been considered as significant (Bauer, Barnes & Reichardt, 2005).

As there are a number of adoption models available to researchers, Venkatesh, Morris, Davis and Davis (2003) synthesized the main models in order to provide a unified view of user acceptance. The unified model identifies determinants and moderators related to intention and it suggests intention is a predictor of use behaviour. Four factors impact on intention and usage: performance expectancy, effort expectancy, social influence and facilitating conditions. The key moderators are gender, age, experience and voluntary use. Interestingly, attitude was considered to overlap with performance and effort expectancies. The non-significance of attitude in the presence of these two other constructs has been supported in a number of other studies (Taylor & Todd, 1995). In empirical studies the unified model was found to be a substantial improvement on any of the other earlier models. Standing, Benson and Karjaluoto (2005) used a version of the unified theory to determine significant factors in the decision to participate in m-marketing schemes and found that granting permission, financial savings and highly relevant information were significant factors in the decision to participate but that the time and effort involved in processing m-marketing messages were not considered important. Work on technology acceptance is still evolving with, for example, studies that integrate user satisfaction constructs with technology acceptance constructs (Wixom & Todd, 2005).

Consumer adoption related factors can be summarized as including the consumer's general attitude toward the technology, level of involvement, innovation, response to stimuli, trust and perceptions of utility, choice, control and risk. Demographic factors (age, gender, income, education) have also been found to be important control variables to consider when looking at consumer acceptance of m-services (Barnes & Scornavacca, 2004; Tsang, Ho & Liang, 2004).

Although it is widely recognized that younger consumers have embraced mobile technology it is being increasingly recognized that factors beyond age or gender may be important. It can be argued that segmenting

people on the basis of their acceptance and use of technology as well as their lifestyle motivations is more representative of their actual behaviour (Sultan & Rohm, 2005). Consumers' adoption of new technologies/services depends on a number of factors, for example, the type of service to be offered, how comfortable people feel using the technology, how user friendly the service interface is, socio-economic factors, motivations (benefits), culture, demographics and psychographics, amount of time that the customer expects to use the service and past experience (Daghfouls, Petrof & Pons, 1999; Sultan & Henrichs, 2000). Sarker and Wells (2003) provide a framework for understanding the adoption and use of mobile devices that includes most of these factors. Their model considers not only the decision made in the initial adoption but also how users appropriate the technology and services through exploration and experimentation. They argue that users assess their experiences on three dimensions: functional (e.g. time savings), psychosocial (e.g. safety, elevated self-worth, sense of freedom) and relational (building relationships).

THE CONCEPTUALISATION OF VALUE AND VALUES

The concept of values is a theme of research in a range of social science disciplines including: anthropology, economics, education, history, marketing, political science, psychology and sociology (Rokeach, 1973). Generally, the concept of value has two different connotations: Values as an individual core belief, and as a perceived direct or indirect benefit of a product/service (Rokeach, 1973). The meaning of "perceived value" (or value) is drawn from definitions related to the "value-for-money" concept. Valerie Zeithaml's (1988) definition is one of the most widely accepted (see Woodruff, 1997, Sweeney et al., 1999; Anckar & D'Incau, 2002). She depicts value as: "The consumers' overall assessment of the utility of a product based on their perception of what is received and what is given" (Zeithaml, 1988, pp14). The concept of perceived value can be called product value as it refers to what consumers' value in terms of product characteristics/benefits. This concept has been considered an important source of competitive advantage for manufactures and retailers (Sheth, Newman & Gross, 1991a; Woodruff, 1999; Forester, 1999; Sweeney & Soutar, 2001).

Sheth, Newman and Gross (1991a, 1991b) conceptualized a model to help explain how consumers make decisions in the marketplace. They based their model on the principle that the choices consumers make are based on their perceived values in relation to what the authors called "market choice". Sheth et al., (1991a) classify five categories of perceived value. Functional values are associated with the utility level of the product (or service) compared to its alternatives. Social values could be compared with the subjective norm dimension in the Theory of Planned Behaviour, as it is associated with willingness to please and social acceptance. Emotional values are those choices made based upon feelings and aesthetics. Epistemic values can be used to describe the early adopters in the sense that it relates to novelty or knowledge searching behaviour. Finally, the conditional value refers to a set of circumstances that depend upon the situation (e.g. Christmas, wedding etc.). Socio-economic and physical aspects are included in this value. These five values were conceptualised based on a diversity of disciplines including social psychology, clinical psychology, sociology, economics and experimental psychology (Sheth et al., 1991a).

Means-End Chains

The concept of values is also addressed through means-end chains. The means-end chain concept concentrates on the systematic relationship between three level of values: product/service attributes, consequences and personal values (Gutman 1982; Reynolds & Gutman 1988). This model represents how the consumption of a product enables the consumer's realization of his/hers desired ends. The central aspect of this theory is that "…consumers choose actions that produce desired consequences and minimize undesirable consequences" (Gutman, 1982 p 61).

In Gutman's (1982) model, product attributes are understood as all tangible and intangible product characteristics such as size, weight, colour etc. Consequences are defined as the physiological or psychological results acquired directly or indirectly by the consumer from his/her behaviour (product or service use). Sheth's et al. (1991a) theory of Consumption Values does not represent end states of existence but expected benefits (consequences) from consuming that particular product or service.

The personal value construct in this model is drawn from the concept used in psychology and sociology and relates to Rokeach's construct of human/personal values. Rokeach (1973) identified two types of values: instrumental and terminal. Instrumental values relate to those values that act like tools in achieving end-state behaviours (values like courage, honesty, ethics, etc.). Terminal values, also used by Gutman (1982), refer to "Preferred end-states of existence" (Gutman, 1982 p.63) for example: accomplishment, happiness and satisfaction. Gutman's model (1982) has two basic underlying assumptions: 1) Values are connected to consequences as long as the consequences have positive or negative connotations and 2) Consequences have a direct relationship with product attributes as long as consumers obtain the products which may cause the desired benefits.

Self esteem	Achievement/fulfilment
Security	Nurturer
Belonging	Well Being
Independence	Honesty/responsibility
Acceptance	Grounded
Individuality	Moral
Happiness	

Table 1: Personal values (Gutman 1982; Rokeach, 1973)

The three levels of product attributes, consequences and personal values are hierarchically interconnected (figure 1). The lower level values are an instrument for consumers to reach their desirable end values (higher levels) (Gutman, 1982; Reynolds & Gutman, 1988). The central aspect of this model assumes that consumers will behave in a way to obtain the desired or positive consequences and minimize the undesirable or negative consequences (Leao & Mello, 2001, 2002). The end values as explained above are ideal end-states or goals.

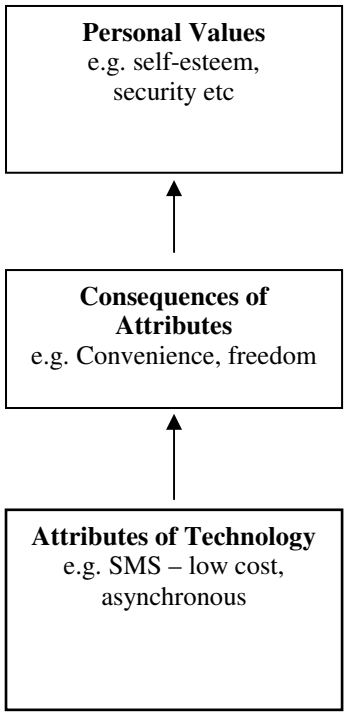

Figure 1: Means-End Chain

Laddering Technique

The laddering technique is a method used to reveal the means-end hierarchy (Gutman 1982; Reynolds & Gutman 1988; Leao & Mello 2002). This ladder refers to the relationship between the three levels of values or abstractions (attribute, consequence and value). It represents the connection between the actual product and the user's cognitive process that leads to a direct and useful understanding of his/hers perceptual orientation in relation to the service. The laddering technique is an in-depth individual interview used to understand consumers' decisions. It translates product attributes into associations relevant to the users "self", based on the means-end chain model. This is done through sequentially asking the respondent the reason why that attribute/consequence was important to him or her (Reynolds & Gutman, 1988). The goal of this strategy of enquiry is to allow the researcher to get to users' actual root reasons for using that particular mobile service (Reynolds & Gutman 1988). Because this technique can be perceived by the respondent as obvious and intrusive it is paramount that the researcher pays particular attention to the interview environment. The environment needs to be friendly and

conducive to introspection in order to seek the underlying drivers behind a given mobile service (Reynolds & Gutman, 1988). It is fundamental that the interviewee perceives the interviewer as very interested at the same time as neutral; his only job is to record the information provided (Reynolds & Gutman, 1982).

The result of the laddering process is a series of cognitive maps or hierarchical value maps (HMV) that show the aggregate consumer means-end chains that link the product or service characteristics with consumer's values.

We applied the mean-end chain and laddering approach to the investigation of the adoption of m-services. For each person an interview lasting between forty minutes to an hour involving closed and open-ended questions was carried out. The questions asked addressed issues related to the respondents' background, personal and family life (significant life events), and personality traits. Then questions were asked about the mobile services they use, usage intensity and reasons for using those particular services/features. An assessment of motives for using particular services was analysed following a laddering approach. This involved why they used the service and what benefits they obtained and this line of enquiry was pursued to obtain the personal values behind the consequences. The following conceptual maps are the result of analysing 28 interviews with mobile service users. The interviewees represent a convenience sample of m-service users and covered late teenagers through to retirees.

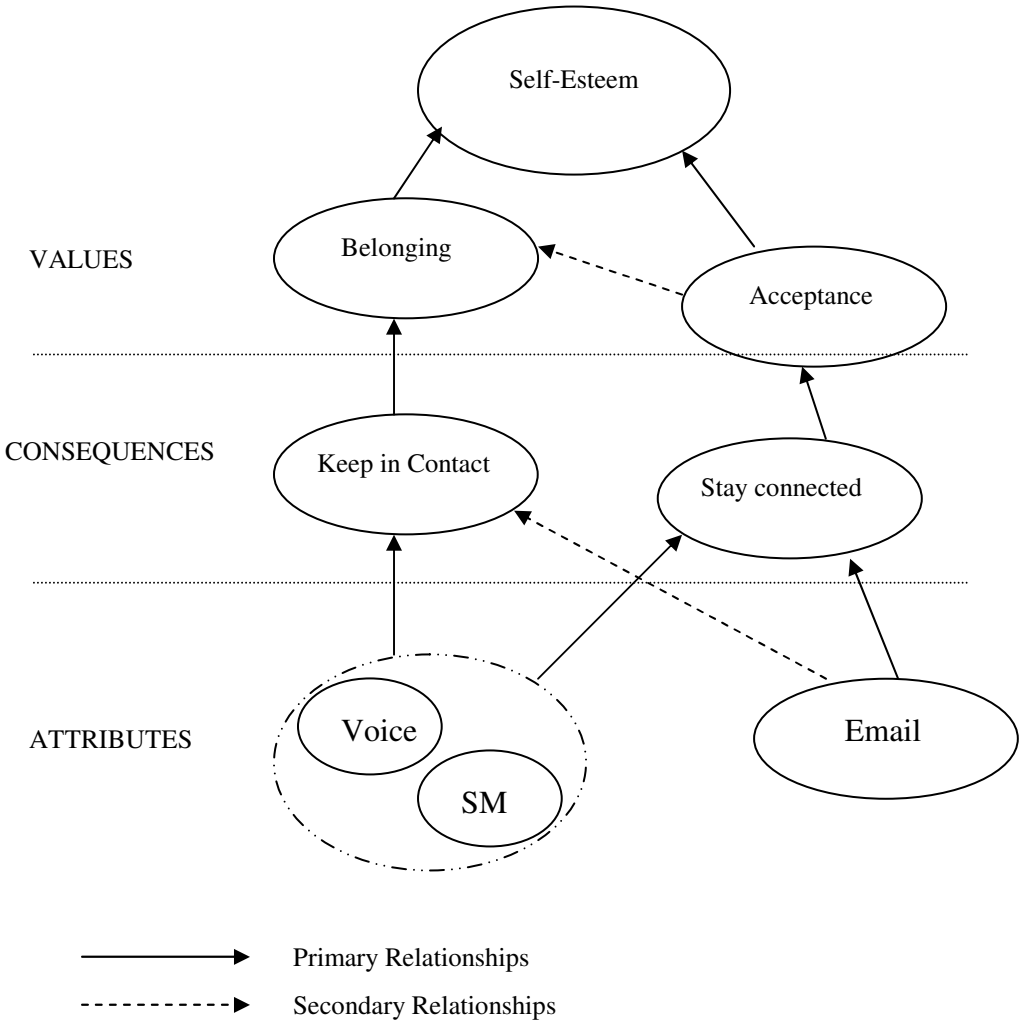

Figure 2: Relational Map

When the data are synthesised from the 28 interviews and analysed three broad patterns emerge. These patterns can be classified under relational, achievement and individual/well-being. The relational map (figure 2) centres around the use of communication to keep in contact and stay connected in order to achieve a sense of belonging and/or acceptance by a group (typically work group). Both of these values can have a positive impact on self-esteem.

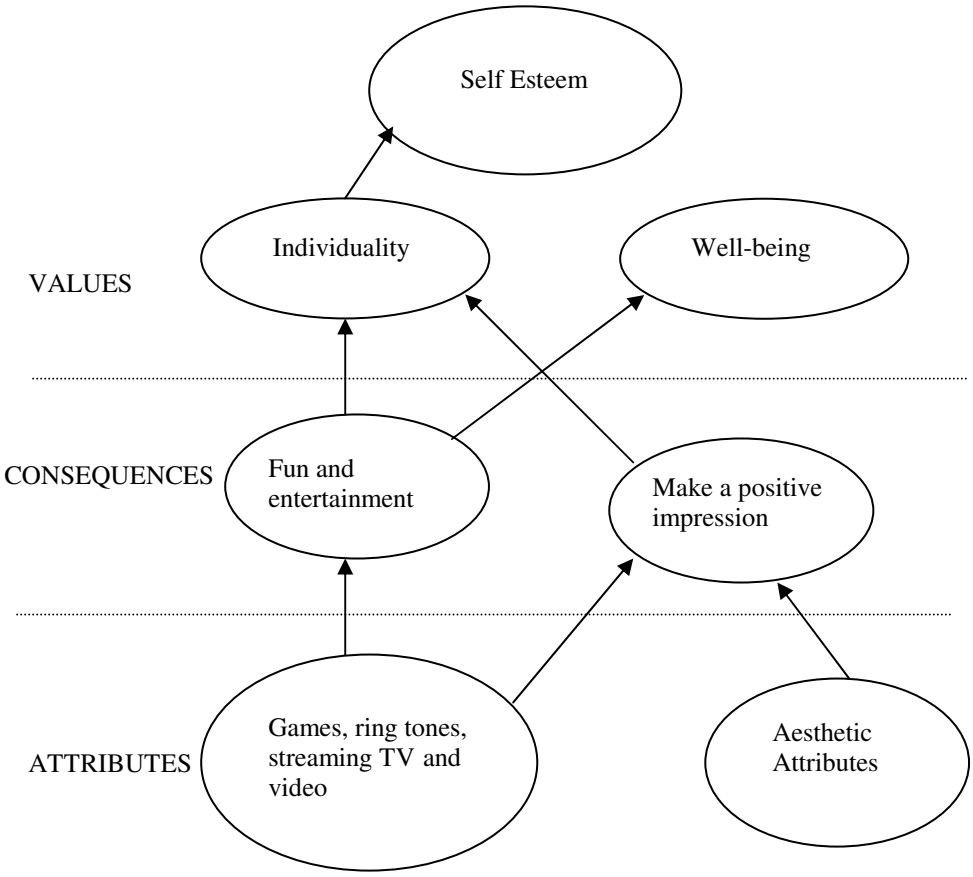

Figure 3: Individuality/well-being Map

Mobile services including games, streaming video and ring tones provide fun and entertainment which create a sense of well-being and individuality which also links to self-esteem. The aesthetic appeal of mobile phones (colour, style) can make a positive impression on people and can support the value of individuality (figure 3). Figure 4 revolves around the use of communication to provide convenience and organisation to improve efficiency. The key value here is sense of achievement that also links to self-esteem.

CONCLUSION

In this paper we have proposed that adoption of m-services at the individual can be better understood through the use of means-end theory and a laddering methodology. We argue that the emphasis given to values through means-end theory takes research on the adoption of technology and services to another level. Much of the research to date on technology adoption has examined technology adoption in organisational settings. Adoption of mobile services typically requires decisions to be made at the individual level yet few researchers are investigating the primitive value drivers. Our study with a small sample of mobile-service users illustrates how means-end chain theory and a laddering style of enquiry can uncover the real value of m-services.

The three cognitive association maps may not be a definitive group for the m-services area. Rather we propose them as a starting point for further research. Nor are the maps mutually exclusive. Mobile services have a functional value as they are convenient but the decision to adopt may often be combined with the desire to feel part of a group or community of use. Indeed, the erosion of boundaries between work, home, leisure, learning and education, partly brought about by mobile technology, means that people may have multiple reasons for adopting or using services. Mobile technology can serve multiple needs including, family, friends, work and curiosity or learning.

The ideas proposed in this paper are currently being tested through a large scale study that involves interviewing over a hundred users of m-services. When this is completed we should be nearer developing a predictive model of m-service adoption. These findings may also be applicable to the adoption of other technologies at the individual level.

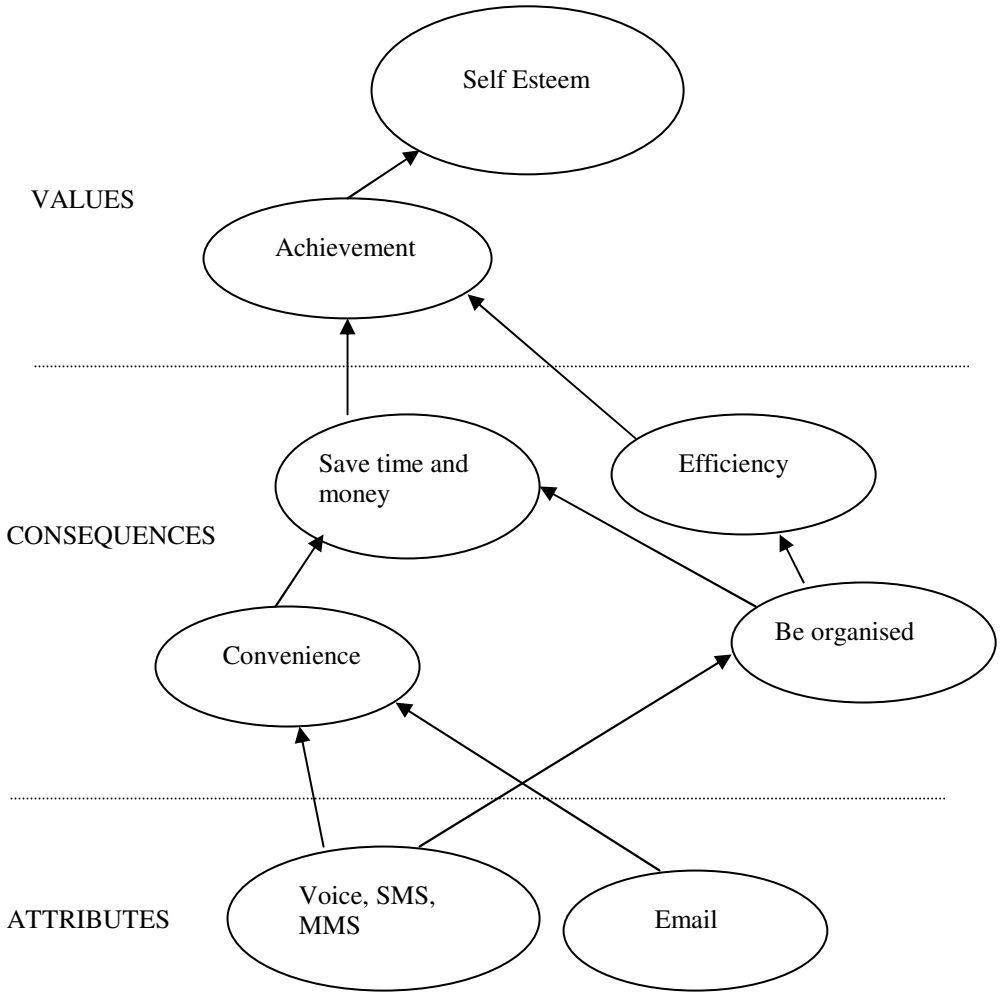

Figure 4: Achievement Map

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